



## Methods and technologies for evaluating and minimising noise from road bridge expansion joints

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### Abstract

Noise generated by traffic crossing road bridges can be a major source of disturbance for local communities and must be carefully considered in planning bridge construction and maintenance projects – especially when specifying expansion joint solutions, since expansion joints are typically mechanical components that introduce discontinuities or unevenness into an otherwise smooth driving surface. The consequences of not adequately considering the potential impact of noise on a community can be substantial, with public relations difficulties and high adaptation or replacement costs. This paper explores the subject of noise associated with bridge expansion joints, including an assessment of what types of joint may be considered quiet, and how noisier types – such as modular or single-gap joints – may be made quieter. Approaches to evaluating noise and what should be considered are discussed, with reference to findings from illustrative noise measurement studies.

**Keywords:** Bridges; expansion joints; noise evaluation; noise reduction; traffic.

### 1 Introduction

Noise generated by traffic is becoming an increasingly important consideration in the planning and construction of transportation routes, as populations and cities grow. On the one hand, more transportation routes are required, often with more housing constructed close by, and on the other, as living standards rise, urban populations exhibit less tolerance for noise from these routes. In response to this, governments are increasingly paying attention to the issue of noise from roads in their regulations and specifications.

When selecting an expansion joint for use on a bridge, care should be taken to ensure that the noise generated by traffic driving over the joint, particularly at night, will not disturb and irritate the local community. In the case of a new bridge, noise from traffic crossing its expansion joints (if not quiet joints) is liable to be the source of greatest disturbance, and in the case of replacement joints on an existing bridge, any increase in noise compared to the previous joints is likely to cause irritation among nearby residents.